

## SPECIFICATION

(all levels quoted  $\pm 1$ dB)

Power output:	40 watts RMS per channel both channels driven at clipping level into 8 ohm loads.
Total harmonic distortion	less than 0.1%, mainly 2nd & 3rd harmonic, negligible proportion of high order harmonics and reducing in proportion with reducing power.
Frequency and power response	$\pm 1$ dB 30Hz to 20KHz.
Output to tape recorder	direct connection from radio and aux. inputs, 200mV from disc amplifier when correctly loaded at average modulation.
Input sensitivity:	Radio 100mV into 200 Kohm flat response
(25W level 8 ohms)	Tape " " " " "
	Auxiliary " " " " "
Magnetic Cartridge	2.5mV into 47K, equalized to R.I.A.A.
Overload capabilities	100mV on magnetic disc input; infinite on radio, aux. and tape inputs.
Signal to noise ratio	80dB on radio, aux, and tape inputs.
(30 phon weighting)	70dB on disc inputs.
Interchannel crosstalk	typically 40dB 20Hz - 10KHz, dependant upon input load impedance.
Rumble filter	Built in on disc input, 12dB per octave below 30Hz.
Control knobs:	Bass $\pm 14$ dB at 40Hz.
	Treble $\pm 14$ dB at 10KHz
	Volume Logarithmic (Channel Balance $\pm 1$ dB maintained to 40dB attenuation)
	Balance $\pm 6$ dB for 180° rotation, either channel eliminated at limits of rotation.
Push buttons to select:	Inputs DISC, RADIO, AUXILIARY, TAPE.
	L.F. filter 18dB per octave below 70Hz.
	H.F. filter turnover 4, 7 or 10KHz, slope 6 or 18dB/octave.
	Function Mono, Stereo, Input Right, Input Left.
General: Power consumption	140 watts maximum.
	Size 15½" x 5" x 9" (400 x 130 x 230mm)
	Weight 24 lbs (11 Kg)

## Instruction Leaflet

**J.E.SUGDEN**

**A48  
Amplifier**

*The right is reserved to change the specification or design without notice.*

J. E. Sugden & Co. Ltd., Carr Street, Cleckheaton, Yorkshire.

## INSTALLATION

The amplifier is fully integrated and supplied complete in a Teak veneered case. This case may be removed if required (after disconnection from the mains) by carefully standing the amplifier on the heat sinks at the rear and unscrewing the four mounting feet on the base. The case may then be lifted clear of the amplifier chassis. Take care not to "snag" the fascia on the cabinet as it is removed.

## CONNECTIONS

### i. Mains

Approximately 10 feet (3 metres) of 3 core cable is supplied for connection to the mains supply. The colour coding of the mains lead is BROWN—LIVE; BLUE—NEUTRAL; GREEN/YELLOW—EARTH. A safety earth terminal is provided on the back panel adjacent to the mains input lead. This terminal may be used for the connection of an earth lead where it is inconvenient to use the green/yellow core of the mains lead. This terminal is NOT for the earthing of ancillary equipment.

A voltage selector plug is provided on the rear panel to cope with all normal supply voltages. This will normally be set for 240 volts, but should any alteration be necessary the plug should be pulled outwards and rotated until the required voltage is in alignment with the arrow marked on the panel. The plug may then be re-inserted into the socket.

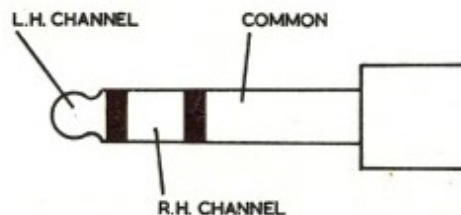
An auxiliary mains output socket is provided for connecting to ancillary equipment such as a turntable or self-powered radio tuner. The total load on this outlet should not exceed 150 watts. Viewing from the underside of the amplifier, the mains fuse (1amp) is located on the right hand side member of the chassis, and the two L.T. fuses (1.5amp) are mounted on the power amplifier printed circuit panels.

### ii Loudspeakers

Loudspeaker connections are made via the red and black 4mm sockets provided on the rear panel. Mains twin flex (14/0076 preferably colour coded for ease of phasing) is recommended for the connecting wire. The amplifier produces its full rated output into loudspeakers of 8 or 4 ohms impedance. It will, however, operate satisfactorily into loudspeakers of higher impedance, but at reduced maximum output (approximately 30 watts into 15 ohms)

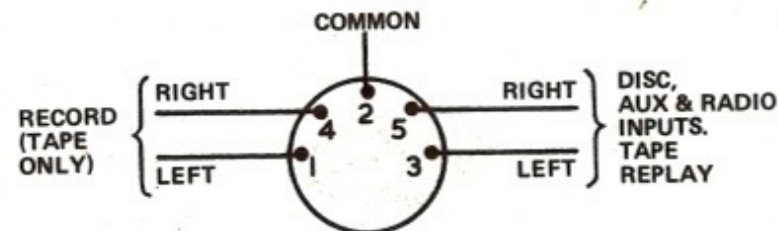
### iii Headphones

A headphone socket is provided on the front panel of the amplifier. When the plug is inserted the loudspeakers are automatically disconnected.



JACK PLUG CONNECTIONS—A21/3 & A48

## iv Inputs



Four input sockets are provided with 5 pin DIN plugs for DISC, AUX., RADIO and TAPE, which should be wired according to DIN standards as shown, viewing from the inside of the plug, i.e. at the solder tag end.

Please note that on DISC inputs, pin 1 is connected internally in the amplifier to pin 5, and may be used as an alternative for R.H. input.

On later models pins 1 and 4 of the AUX socket are also connected via attenuators to pins 1 and 4 of the tape socket to provide a record output at DIN low level to suit the DIN record input requirements of the majority of CASSETTE RECORDERS.

### Earthing of DISC input

It is important that the L.H. and R.H. screened leads from the pick-up cartridge, and the chassis lead (sometimes combined in the pick-up lead) should be connected ONLY to pin 2 of the DIN plug. Do NOT connect to the plug body, and care must be taken to insulate the screens from the plug body securing clip.

### Adjustment of disc sensitivity

The sensitivity of the disc input has been carefully chosen to match most of the high quality cartridges currently available. There are a few cartridges which offer a much higher output, the use of which may necessitate a reduction of disc sensitivity — indicated by a need to operate the volume control at low settings, i.e. about 9.00 o'clock. Your dealer can do this for you. He should remove the amplifier from its cabinet, remove the control knobs and carefully remove the fascia. The front panel securing screws in each corner are then removed when the front panel can be pulled forward to reveal the disc amplifier circuit board upon which will be seen two pairs of pins linked by a thin wire. If these wires are removed the resultant sensitivity will be 10mV instead of 2.5 or if they are replaced by 4.7K ohm resistors the sensitivity will be approximately 5mV. The overload capacity increases in the same proportion. On later models it is unnecessary to remove the front panel. Access to the links can be made through the two holes in the side plate.

## OPERATION

Control facilities are provided by means of four knobs - BASS, TREBLE, BALANCE, combined VOLUME - ON/OFF switch, and ten push buttons on the front panel.

The push buttons, which are of independent push on and push off operation offer facilities as follows:

INPUT SELECTION—this is controlled by the two extreme left hand buttons allowing three selections to be made—

DISC button in	magnetic cartridge
RADIO (DISC & AUX in)	radio (stereo or mono)
AUX in	auxiliary

The AUX facility has the same sensitivity as the RADIO input allowing the use of an additional tuner or other high level programme source.

## TAPE

To play pre-recorded tape the TAPE button should be depressed. To record from programme sources, e.g. disc or radio, it is necessary to depress those input buttons normally required to select that source (as described above). The selected input is automatically connected to the tape output socket. If the output from the monitoring circuit on the tape recorder is connected to the tape input of the amplifier, A-B monitoring is possible by depressing the TAPE button.

## FILTERS

The low frequency filter is selected by depressing the LF Filter button and is useful for removing rumble, traffic and wind noise from the programme material. The turnover frequency is 70Hz and the rate of attenuation 18dB per octave. The high frequency filters are useful for removing distortion, hiss and surface noise from poor programme material and are selected by depressing one or both of the HF filter buttons. The rate of attenuation or slope is 6dB per octave and can be increased to 18dB per octave by depressing the steep button. The button marked 7KHz selects the 7KHz turnover frequency, the 10KHz button the 10KHz turnover frequency and both buttons together the 4KHz turnover frequency.

## QUIET

The quiet button selects the quiet listening facility. Normal level should first be set on the volume control and the quiet button depressed. The mid frequency level will then be attenuated 16dB but the lower frequencies to a less extent to cater for the equal subjective loudness effect of the ear. This facility is useful for applications such as background music.

## FUNCTION

The two end right hand buttons select as follows:—

STEREO (both buttons out)	Stereo
LEFT in	left hand input to both amplifiers
RIGHT in	right hand input to both amplifiers
MONO (both buttons in)	left and right hand inputs mixed to both amplifiers.

## A48

### Component List Pre-Amplifier Section

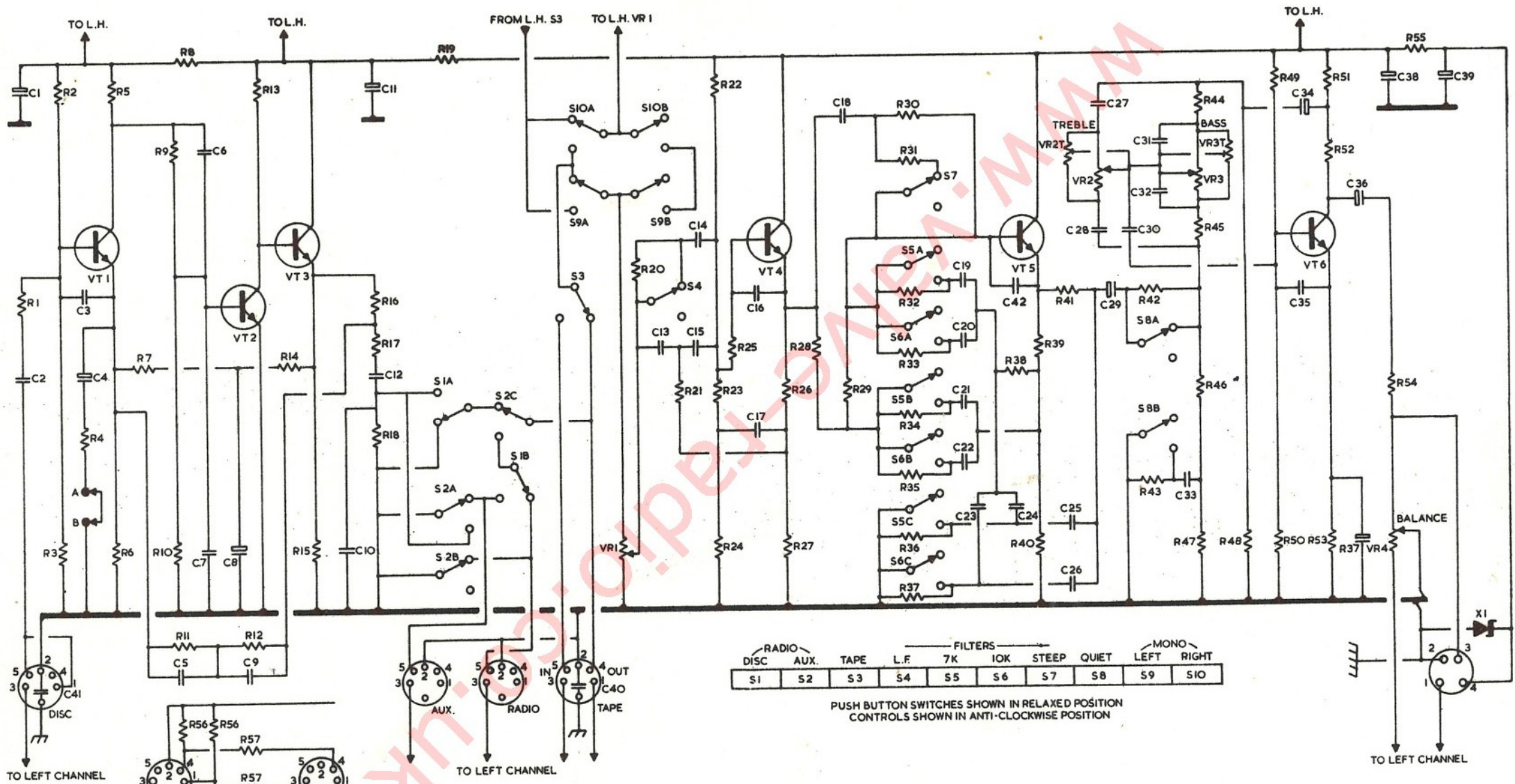
R 1	2K7	R41	2K2	C16	470p	VT1	BC109S
R 2	330K	R42	10K	C17	.022	VT2	BC109S
R 3	56K	R43	1M	C18	.1	VT3	BC109S
R 4	2K2	R44	18K	C19	2200	VT4	BC109S
R 5	100K	R45	18K	C20	1500	VT5	BC109S
R 6	8K2	R46	1K5	C21	4700	VT6	BC109S
R 7	22K	R47	6K8	C22	3300	X1	BZY88-C27
R 8	2K2	R48	47K	C23	1500		
R 9	2M2	R49	470K	C24	2200		
R10	470K	R50	68K	C25	.01		
R11	1M	R51	1K	C26	6800		
R12	75K	R52	4K7	C27	.01		
R13	10K	R53	1K2	C28	.01		
R14	39K	R54	4K7	C29	2.5		
R15	15K	R55	220	C30	.1		
R16	4K7	R56	33K	C31	.022		
R17	4K7	R57	470K	C32	.022		
R18	8M2			C33	.22		
R19	680	VR1	250K Log	C34	2.5		
R20	8M2	VR2	50K	C35	1000p		
R21	100K	VR2T	220K	C36	2.5		
R22	1M	VR3	250K	C37	470		
R23	220K	VR3T	1M	C38	470		
R24	220K	VR4	50K	C39	470		
R25	1K2			C40	.01		
R26	1K	C 1	100	C41	.01		
R27	4K7	C 2	.22	C42	470p		
R28	10K	C 3	470p				
R29	10K	C 4	100				
R30	1M	C 5	3600				
R31	1K2	C 6	.1				
R32	8M2	C 7	47p				
R33	8M2	C 8	10				
R34	8M2	C 9	1000p				
R35	8M2	C10	470p				
R36	8M2	C11	100				
R37	8M2	C12	.22				
R38	4K7	C13	.01				
R39	1K	C14	.1				
R40	3K9	C15	.01				

### Power Amplifier Section

R 1	5K6	VR1	220K	X 1	BAX13
R 2	5K6	VR2	4K7	X 2	BAX13
R 3	2M2			X 3	BAX13
R 4	470K	C 1	270p	X 4	BAX13
R 5	6K8	C 2	0.1	X 5	SKE1/02
R 6	1K5	C 3	2200p	X 6	SKE1/02
R 7	8K2	C 4	470	X 7	SKE1/02
R 8	4K7	C 5	1000p	X 8	SKE1/02
R 9	47	C 6	0.1		
R10	8K2	C 7	100		
R11	2K2	C 8	100		
R12	220K	C 9	470p		
R13	10K	C10	270p		
R14	10K	C11	470p		
R15	100	C12	47p		
R16	1K2	C13	470		
R17	1K2	C14	2500		
R18	1K2	C15	2500		
R19	4K7	C16	2500		
R20	3K9	C17	0.1		
R21	1K8				
R22	390				
R23	3K9				
R24	10				
R25	10				
R26	1K5				
R27	1K5				
R28	2K7				
R29	2K7				
R30	100				
R31	100				
R32	0.33				
R33	0.33				
R34	10				
R35	10K				
R36	390				
R37	390				
R38	1.0				
Rx*	27K-220K				

VT 1 BC109C  
VT 2 ZTX341  
VT 3 BD519  
VT 4 BC548  
VT 5 BC548  
VT 6 BC558  
VT 7 BD519  
VT 8 BD520  
VT 9 2N3055 Motorola  
VT10 MJ2955

\* For channel balance (one channel only) Adjust on test.

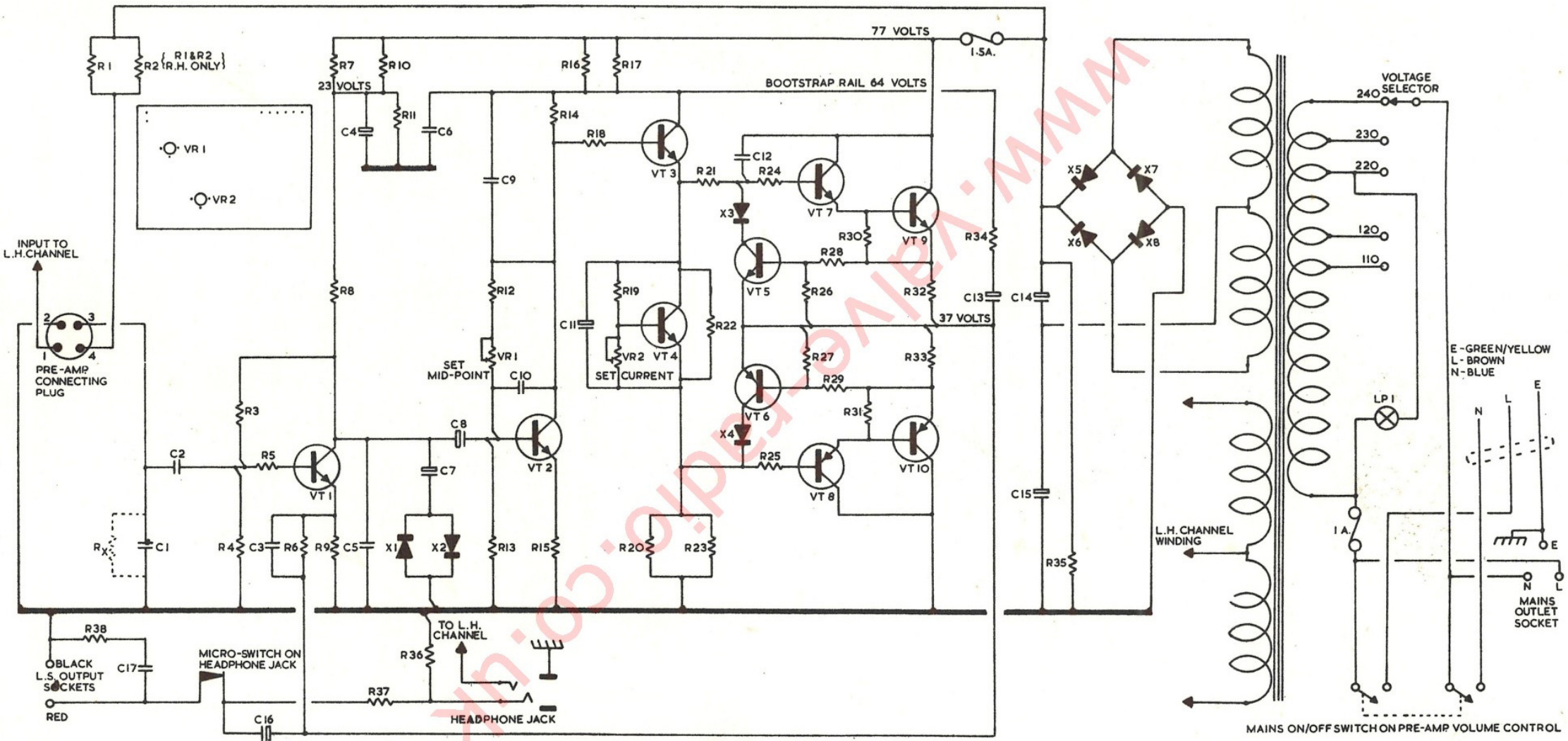


RADIO			FILTERS					MONO	
DISC	AUX.	TAPE	L.F.	7K	10K	STEEP	QUIET	LEFT	RIGHT
S1	S2	S3	S4	S5	S6	S7	S8	S9	S10

PUSH BUTTON SWITCHES SHOWN IN RELAXED POSITION  
 CONTROLS SHOWN IN ANTI-CLOCKWISE POSITION

ATTENUATOR OF RECORD OUTPUT FOR  
 CASSETTE RECORDERS CONNECTED TO  
 AUX. SOCKET  
 (FITTED FROM SERIAL NUMBER 601  
 ONWARDS)

**A 48**  
**— PRE-AMPLIFIER —**  
 (R. H. CHANNEL SHOWN IN DETAIL)



— POWER AMPLIFIER-A48 —  
(R.H. CHANNEL SHOWN IN DETAIL)